ORIGINAL ARTICLE

Healthcare access, utilization, and quality after a disaster: results from the Brumadinho Health Project

Acesso, utilização e qualidade dos serviços de saúde após um desastre: resultados do Projeto Saúde Brumadinho

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ABSTRACT

Objective: In January 2019 a dam at the Córrego do Feijão mine suffered a catastrophic failure that killed 270 people and caused extensive damage. It is unknown how exposure to such a disaster might affect healthcare utilization. **Methods:** We assessed survey data from the Brumadinho Health Project, a cohort study that includes people who were exposed to the dam failure and two comparison groups: people unexposed to mining or the disaster and people from a mining community, but not exposed to the disaster. Main outcomes include any doctor visit or hospitalization in the past year, having a usual source of healthcare, having blood pressure and blood sugar checked, and being up to date with vaccinations, for adults 18 years and over. We used survey-weighted robust Poisson regression to assess differences between those exposed and the two comparison groups while controlling for confounders. **Results:** In multivariable models, the exposed group had a 15% higher chance of having a doctor visit than the unexposed group. For hospitalization and reports of blood pressure and blood sugar assessments, there was no significant difference among any of the groups. The exposed group had a 24% higher chance and the unexposed mining community had a 143% higher chance of being up to date with immunizations, as compared to the unexposed group. **Conclusion:** There were some differences in healthcare utilization among individuals exposed to the dam failure. Continued monitoring of the situation is warranted, as the full consequences of such a traumatic event may take considerable time to unfold.

Keywords: Disaster. Healthcare. Mining. Cohort.

INTRODUCTION

On January 25, 2019, a tailings dam (used to store the byproducts of mining operations) at the Córrego do Feijão mine suffered a catastrophic failure and released a mudflow of about 13 million cubic meters into Brumadinho, a municipality located in the southern central portion of the state of Minas Gerais, Brazil. Two-hundred and seventy people died as a result of the collapse, which also caused extensive property and environmental damage[1].

The potential health effects of such a disaster, beyond immediate deaths and injuries, are myriad. For this reason, the Brumadinho Health Project, a prospective cohort study coordinated by the Oswaldo Cruz Foundation in Minas Gerais (Fiocruz Minas) and the Federal University of Rio de Janeiro (UFRJ), was developed to assess the living and health conditions of residents of the municipality of Brumadinho. The design of the cohort, described below and on the project website http://www.minas.fiocruz.br/saudebrumadinho, includes those directly affected by the dam failure and two comparison groups: those not affected by either the dam failure or mining activity and those who were unexposed to the disaster but live in an area with mining activity[2].

Disasters of different types, in addition to immediate damage, lead to important changes in morbidity and mortality, such as potentially increased rates of communicable or vector-borne diseases, mainly due to environmental changes, and non-communicable chronic diseases, such as cardiovascular, respiratory, and mental disorders. These consequences may increase the need for a range of healthcare services, often resulting in greater rates of doctor consultations and hospitalizations[1,3]. Because the effects of exposure to such a traumatic and potentially life-threatening event may take time to manifest, it is therefore important to monitor the health needs of the affected populations and provide additional support if existing healthcare services are unable to respond to the increased demand[4].

The purpose of this study is to describe the results of adult participants in the baseline survey of the Brumadinho Health Project as they relate to patterns of healthcare access and utilization, compare these patterns with those in the state of Minas Gerais and Brazil, and test whether those directly affected by the dam failure differ in their use of healthcare services from those who were not directly affected.

METHODS

Data and sampling design

The survey sampling plan was designed to represent the population residing in the municipality of Brumadinho, aged 12 years or older. Furthermore, the sample aimed to obtain information on those directly affected by the dam failure as well as individuals not directly affected by the dam failure or mining activity and a sample of individuals unexposed to the disaster but residing in an area with mining activity.

The sampling plan incorporated stratification of the population by census sector, as established by the Brazilian Institute for Geography and Statistics (IBGE) in 2019. One hundred and seven census tracts were sampled. In regions (census tracts) affected by the disaster, all households were included. Residents of the Córrego do Feijão region at the time of the disaster who no longer lived there were also included since many properties were destroyed, sold, or abandoned. In areas considered not directly affected, the stratified sample included seven households (primary sampling units) randomly selected by simple inverse sampling. For each selected household, all residents aged 12 years and older who consented to participate in the research were interviewed. A total of 3,080 people (2,805 adults aged 18 or older) were interviewed with an overall response rate of 86.4%.

For comparison purposes, we also used the latest (2019) version of the Brazilian National Health Survey (PNS) (2019), conducted by IBGE in partnership with the Ministry of Health. The PNS uses a complex sample design in three stages. In the first stage, primary sampling units (PSU), represented by census tracts, are randomly selected from a master file of census tracts stratified by geographic region, and urban/rural location. In the second stage, households are selected from PSUs. Finally, adult respondents are randomly selected from households for more detailed interviews. Pre-scheduled face-to-face interviews were conducted using structured questionnaires that cover a range of demographic, socioeconomic, and health-related questions[5,6]. The PNS 2019 sampling design makes it representative at the state (UF), regional, and national levels.

Ethics statement

The Brazilian National Research Ethics Commission approved the PNS-2019 in August 2019 (No 3529376) and the Brumadinho Health Project was approved by the Research Ethics Committee of the Oswaldo Cruz Foundation, Minas Gerais on February 7, 2020 (CAAE 20814719.5.0000.5091). All respondents provided informed consent to participate in the study.

Outcome measures

This analysis includes only adult respondents aged 18 and older. We constructed several outcome measures. These include:

1. Whether the individual visited any doctor in the past 12 months;
2. Any hospitalization for at least 24 hours in the past 12 months;
3. Whether the person had a usual source of medical care they go to each time they have a health problem or need healthcare advice;

4. Whether the individual has had their blood pressure and blood sugar checked in the past 12 months; and
5. Whether the individual received a yellow fever, influenza, or coronavirus vaccine in the past 12 months.

For comparison with the PNS 2019, we additionally looked at the mean number of doctor visits in the past year and a series of questions about access and quality of primary care, including whether participants agreed that the doctor was easy to reach by phone, it was easy to contact the doctor, the patient is always able to see the same doctor, the doctor knows about the patient's health problems, and whether it is easy to explain health problems to the doctor. These questions were operationalized as dichotomous (yes/no) variables by recoding the responses always/mostly as 1 (yes) and rarely/never as 0 (no).

Exposure categories

These include:

1. Those directly affected by the dam failure at the Córrego do Feijão Mine, referred to as the "exposed group";
2. Those residing in an area with mining activity referred to as the "mining community"; and
3. Those not directly affected by the dam failure or mining activity, referred to here as the "unexposed group".

Control variables

Following Anderson's conceptual healthcare access framework[7], our analyses control for predisposing, enabling factors, and need factors that influence healthcare access and needs among the three exposure groups. Predisposing factors include 10-year age groups, gender, self-reported skin color (operationalized as white versus others), and educational attainment, which was operationalized as those with complete primary school (*Ensino Fundamental 1/Primário* in Portuguese) or less versus those with some secondary education (*Ensino Fundamental 2/Ginásio* in Portuguese) or more. Enabling factors include conjugal status (partnered versus single), household wealth (constructed by extracting the first factor from principal components analysis of a list of household items and divided into tertiles), and while all those residing in the municipality are covered by the Brazilian Family Health Strategy, some had additional healthcare coverage through private health plans. Health needs were assessed by extracting the first factor from principal components analysis of a list of self-reported medical diagnoses of common chronic conditions and risk factors (high cholesterol, heart attack, angina, heart failure, stroke, asthma, bronchitis, arthritis, gastritis, liver disease, kidney disease, epilepsy, spinal problems, cancer, hypertension, diabetes, depression) and poor/very poor self-rated health and divided into tertiles, representing those with low health needs (the healthiest), medium health needs, and high health needs (the sickest). The extracted factor was the only component with an Eigenvalue of 1 or more.

Statistical analyses

We describe proportions/means and 95% confidence intervals (CIs) for outcomes and control variables, stratified by exposure category. Given the complex, weighted survey design, we used Chi-squared tests with Rao-Scott correction and t-tests to assess differences between the three groups and adjusted Wald tests for hypothesis testing[8]. We then estimated associations between health outcomes and sociodemographic characteristics using robust survey-weighted Poisson regression to obtain adjusted prevalence ratios. Finally, we generated predicted probabilities after multivariable probit regression analyses and plotted the results to visualize the complex interactions between age group, sex, and exposure category for doctor visits. For comparing PNS 2019 to the Brumadinho Health Project data, each dataset was analyzed separately. If there was no overlap between the 95%CIs from estimates made on the same variables in the two surveys, we could say that the difference is statistically significant. However, we noted that it is still possible that estimates between the two datasets differ statistically even if their 95%CIs slightly overlap.

RESULTS

Table 1 describes the characteristics of the study participants stratified by exposure status. Some demographic, educational, and health-related dimensions differ among the three groups. The mean age of those in the unexposed group is the highest, nearly 49 years. There is a larger proportion of women in the unexposed group and a significantly higher proportion of those who describe their skin color as white, nearly twice as high as that of those in the mining community. The unexposed group had a higher proportion of individuals completing secondary education than the exposed or mining groups. In terms of the presence of different household goods (wealth), there was no statistically significant difference among the groups. The three groups differ significantly in terms of their health needs. In terms of healthcare utilization, those in the exposed group are more likely than the other two groups to have had a doctor visit in the past 12 months. There was no statistically significant difference among groups in terms of having a hospital visit in the past year. There were large differences in terms of having a usual source of healthcare, with the mining community reporting the highest rate at nearly 80%. On average, about 39% of all participants had been immunized for influenza, yellow fever, and coronavirus in the past year. However, this proportion reached 71% among the mining community. Almost 80% of the participants had their blood pressure checked in the past year and about 56% of the participants recall having their blood sugar assessed. Neither of these measures differed across the groups. Finally, coverage by a private health plan was also significantly different across the groups.

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Table 1 in the Appendix provides additional context for the main indicators assessed within the population of Brumadinho. In general, having a doctor visit in the past year was nearly 10 percentage points lower in Brumadinho than in the state of Minas Gerais or Brazil as a whole. However, for the mean number of doctor visits over the past 12 months, the 95%CIs for the three areas overlap. Mean rates of hospitalization were similar across all three areas. Coverage by the Family Health Strategy was higher in Bru-

madinho (100%) as well as coverage by a private health plan. Point estimates of measures of clinical care such as having blood pressure and blood sugar tested in the past 12 months were slightly lower in Brumadinho as compared to the state and country as a whole. Respondents also had slightly lower rates of having a usual source of medical care within the municipality. Overall, the residents of the municipality of Brumadinho report slightly better access to primary care and assess their doctor's communication

Table 1. Characteristics of the sample, by exposure status. The Brumadinho Health Project, 2021.

	Unexposed n=1,453	Exposed n=881	Mining only n=471	Total n=2,805
Age (mean)	48.60	45.07	43.71	48.42*
	[47.37–49.83]	[43.71–46.42]	[42.03–45.38]	[47.25–49.60]
Female	56.84	51.73	54.91	56.65
	[54.44–59.20]	[49.51–53.95]	[51.79–58.00]	[54.37–58.91]
Partnered (v single)	59.57	63.5	57.03	59.65
	[56.14–62.91]	[59.45–67.38]	[51.63–62.27]	[56.37–62.84]
White (v others)	43.04	28.04	22.1	42.23*
	[39.46–46.69]	[24.72–31.62]	[18.21–26.56]	[38.82–45.72]
Secondary education +	63.33	52.72	56.72	62.92*
	[60.39–66.17]	[48.96–56.46]	[51.84–61.46]	[60.11–65.65]
Wealth 1 (poorest)	31.37	30.26	36.92	31.43
	[27.57–35.44]	[26.04–34.85]	[30.42–43.94]	[27.80–35.31]
Wealth 2 (middle)	29.4	35.21	33.9	29.65
	[25.49–33.63]	[30.36–40.39]	[27.59–40.85]	[25.91–33.68]
Wealth 3 (richest)	39.23	34.53	29.17	38.92
	[34.94–43.70]	[29.55–39.86]	[22.97–36.27]	[34.82–43.19]
Health needs[†] (low)	35.25	30.6	34.77	35.1*
	[32.06–38.58]	[27.72–33.64]	[30.54–39.27]	[32.06–38.27]
Health needs[†] (medium)	35.23	29.51	32.74	35.01
	[32.17–38.41]	[26.71–32.47]	[28.88–36.85]	[32.10–38.05]
Health needs[†] (high)	29.52	39.89	32.49	29.88
	[26.51–32.73]	[36.74–43.13]	[28.38–36.88]	[27.00–32.94]
Doctor visit <12 months	73.25	83.93	78.1	73.64*
	[70.52–75.81]	[81.37–86.20]	[73.89–81.79]	[71.04–76.09]
Hospital visit <12 months	9.38	8.9	13.87	9.44
	[7.48–11.69]	[7.22–10.93]	[10.97–17.39]	[7.62–11.63]
Usual source of care	59.16	38.99	76.92	58.85*
	[55.89–62.34]	[35.91–42.17]	[72.47–80.85]	[55.75–61.89]
All vaccines up to date	38.12	38.64	71.1	38.66*
	[35.04–41.29]	[35.11–42.30]	[65.06–76.46]	[35.71–41.69]
BP checked	78.88	80.28	83.92	79
	[76.06–81.44]	[77.00–83.19]	[80.13–87.11]	[76.31–81.46]
Blood sugar checked	56.47	53.47	58.18	56.41
	[53.25–59.64]	[49.31–57.59]	[53.54–62.68]	[53.33–59.45]
Private health plan	35.66	24.14	28.44	35.19*
	[32.33–39.13]	[20.71–27.94]	[23.24–34.29]	[32.01–38.50]

BP: blood pressure; *p<0.001; [†]Health needs (low, medium, high) were assessed by a measure created from principal components analysis of the number of chronic conditions and poor self-rated health and divided into tertiles where the category "few" refers to those with the smallest number of health problems. P-values from chi-squared tests with Rao-Scott correction that assess differences within categories.

skills (my doctor knows about my health problems, easy to explain problems to my doctor) as superior to those in Minas Gerais or Brazil as a whole.

Because healthcare utilization depends on several factors, including the level of health needs and age, Figure 1 shows the adjusted predicted probability of having a doctor visit in the past 12 months and compares it with low, medium, and high health needs by age group in the municipality of Brumadinho and the state of Minas Gerais. For individuals with high and medium health needs, the probability of having a doctor visit in the past 12 years increases slightly with age, but as can be seen in Appendix Table 2, the 95%CIs for these estimates overlap. For individuals living in Brumadinho who report low health needs, the chance of having a doctor visit was approximately 20% lower than that observed in Minas Gerais, all else equal, and as presented in Appendix Table 2, this difference was significant for most age groups.

Table 2 shows the results from a multivariable regression analysis to further explore differences in healthcare utilization and clinical quality of care among residents of Brumadinho, based on whether they were exposed to the dam collapse. For doctor visits, those in the exposed group had about a 15% higher chance of having a doctor visit than those who were unexposed.

Individuals from the mining community had a similarly elevated rate of having a doctor visit. Women, those with greater household wealth, those with greater health needs, and those who have a private health plan also had a higher chance of a doctor visit. For hospitalization in the past year, there is no significant difference between the exposed and unexposed groups. However, those from the mining community had a nearly 50% higher chance of hospitalization in the past year as compared to the unexposed group. The only other significant predictor of hospitalization was having high health needs. People in the exposed group reported a 29% lower chance of having a usual source of medical care than those in the unexposed group, while those in the mining community had a higher likelihood of reporting a usual source of medical care than the control group. Having a usual source of medical care was higher among those of older age, women, those who identify themselves as white, those with higher education, those with high health needs, and those who have a private health plan. Reports of a blood pressure check in the past year did not differ between the exposed
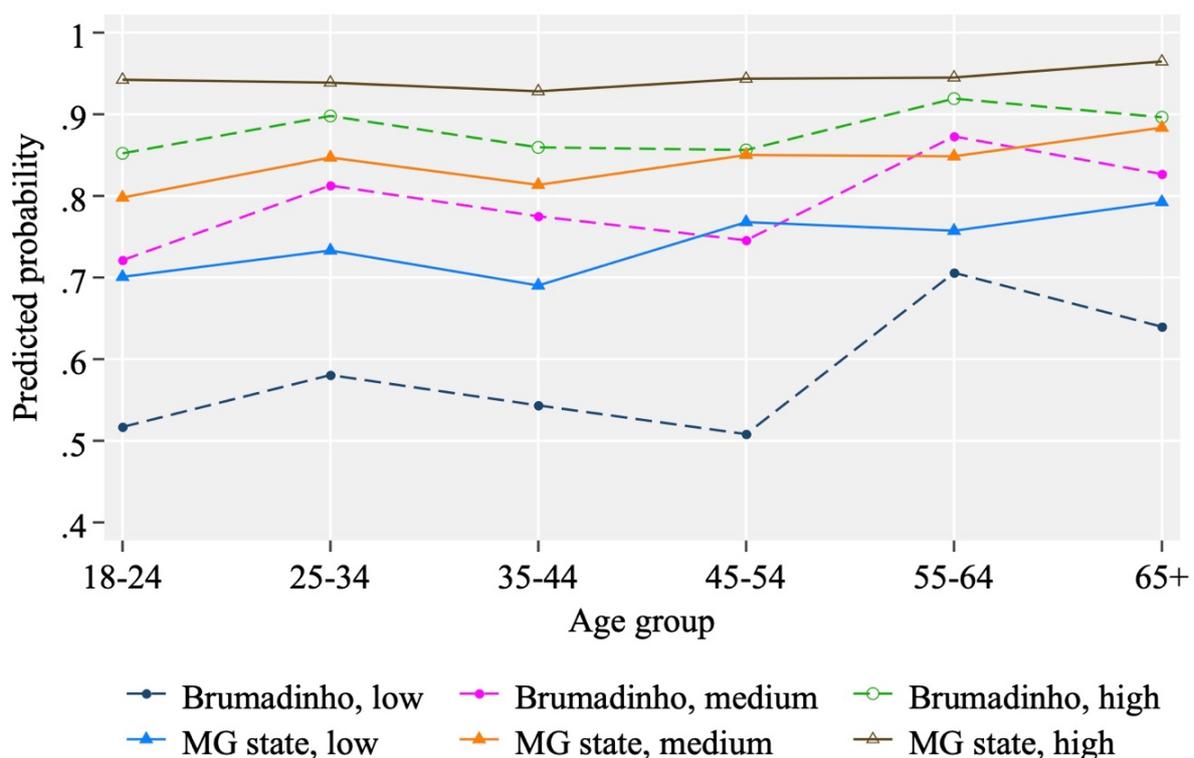
MG: state of Minas Gerais.

Health needs (low, medium, high) were assessed by a measure created from principal components analysis of the number of chronic conditions and poor self-rated health and divided into tertiles where the category "few" refers to those with the smallest number of health problems.

Numbers are from two separate survey-adjusted weighted probit regression analyses that control for age, sex, marital status, health needs, private health plan, and household wealth tertiles.

Data for Brumadinho are from the Brumadinho Health Project, data for MG are from the Brazilian National Health Survey (PNS 2019).

Figure 1. Predicted probability of having at least one doctor visit in the past 12 months, by age group, geographic location, and health needs. The Brumadinho Health Project, 2021.

Table 2. Factors associated with healthcare service utilization and quality.

	Doctor visit	Hospital	USC	BP check	Diabetes check	All vaccines
Exposed (v not)	1.15*	0.89	0.71*	1.05	0.86	1.24*
	1.09–1.20	0.65–1.2	0.64–0.7	0.99–1.1	0.65–1.15	1.10–1.41
Miners (v not)	1.12*	1.49[†]	1.42*	1.11*	1.27	2.43*
	1.05–1.19	1.08–2.0	1.31–1.5	1.04–1.1	0.94–1.70	2.11–2.78
Age	1.00	1.00	1.01*	1.01*	1.03*	1.03*
	1.00–1.00	0.99–1.0	1.00–1.0	1.00–1.0	1.02–1.04	1.03–1.04
Female (v male)	1.13*	1.1	1.22*	1.05	1.41	1.02
	1.06–1.22	0.71–1.6	1.11–1.3	0.99–1.1	0.99–2.02	0.91–1.15
Partnered (v single)	1	0.95	0.99	0.96	0.91	0.99
	0.93–1.07	0.64–1.4	0.89–1.1	0.90–1.0	0.66–1.26	0.84–1.16
White (v others)	1.03	0.96	1.11[†]	1.04	1.09	1.11
	0.97–1.10	0.62–1.4	1.00–1.2	0.98–1.1	0.79–1.50	0.96–1.28
Secondary ed (v less)	0.97	0.91	1.19[‡]	1.00	0.93	1.09
	0.90–1.05	0.56–1.4	1.06–1.3	0.93–1.0	0.62–1.37	0.91–1.30
Wealth 2 (v poor)	1.11	1.02	1.04	1.08	1.47	1.04
	1.00–1.24	0.65–1.6	0.89–1.2	0.98–1.1	1.03–2.11	0.84–1.27
Wealth 3 (v poor)	1.19[‡]	0.9	1.00	1.09	0.75	1.29[†]
	1.07–1.32	0.51–1.5	0.84–1.1	1.00–1.2	0.45–1.25	1.04–1.58
Health 2 (v low)	1.33*	1.57	1.17[†]	1.2*	5.47[‡]	1.19[†]
	1.20,1.47	0.85–2.9	1.03–1.3	1.10–1.3	1.94–15.46	1.00–1.40
Health 3 (v low)	1.5*	2.76*	1.32*	1.31*	10.52*	1.22[†]
	1.36–1.65	1.56–4.8	1.16–1.5	1.20–1.4	3.76–29.43	1.02–1.46
Private plan	1.2*	1.34	1.23*	1.17*	1.09	1.22[†]
	1.10–1.30	0.88–2.0	1.09–1.4	1.08–1.2	0.68–1.74	1.01–1.47
N	2,676	2,755	2,765	2,757	2,766	2,738

USC: usual source of medical care; BP check: blood pressure assessment; diabetes check: assessment of sugar in the blood; vaccines: yellow fever, influenza, and coronavirus. *p<0.001; [†]p<0.05; [‡]p<0.01.

and unexposed groups. However, the mining community had an 11% higher chance, approximately, of reporting a recent blood pressure check. This proportion increased with age and health needs and for those with a private health plan. There are no differences across the groups in terms of having a blood sugar (diabetes) assessment, once age and health needs are controlled. Finally, those in the exposed group had a 24% higher chance and those in the mining community had a 143% higher chance of having received vaccines for influenza, yellow fever, and coronavirus in the past year than did those in the unexposed group. Vaccine coverage increased with age, with higher household wealth, and with increased health needs and for those with a private health plan.

Figure 2 shows the predicted probability of any doctor visit in the past year by exposure status, age group, and sex, among the three groups present in the Brumadinho cohort. These figures have been adjusted for all of the covariates presented in Table 2 and stratified by sex. For both men and women, the probability of having a doctor visit in the past year increases with age. Those in the unexposed community, once other factors are statistically controlled, had the lowest rates of doctor visit by age and sex. Those in the exposed communities reported the highest probability at every age and for both men and women, while those in the mining community had intermediate predicted rates of a doctor visit. The gap between the exposed and unexposed groups was highest among men, especially in the youngest age groups.

DISCUSSION

The failure of the tailings dam at the Córrego do Feijão mine resulted in a major loss of human life and considerable destruction of property and the environment. But the long-term consequences of being exposed to such a disaster are yet unknown. The Brumadinho Health Project seeks to monitor the health and well-being of those exposed to the disaster using a strong research design that includes two different comparison groups. The study has found that
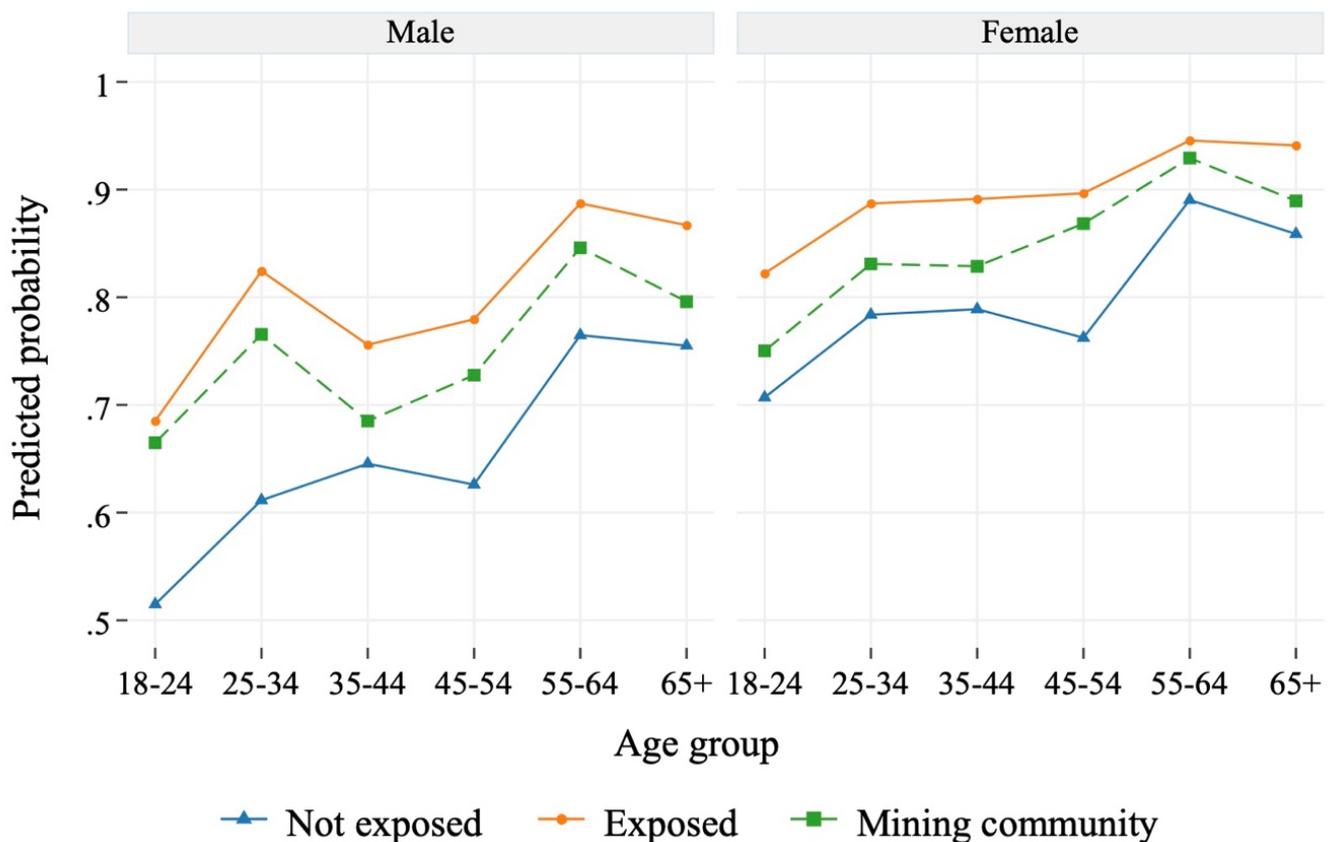
Figures are predicted probabilities from survey-adjusted weighted probit regression analyses that control for exposure category, age, sex, marital status, health needs, private health plan, household wealth tertiles, and adjust for the complex sample and include sampling weights.

Figure 2. Predicted probability of having at least one doctor visit in the past year, by exposure status, age group, and sex. The Brumadinho Health Project, 2021.

the three groups examined here differ in important demographic, educational, and health-related characteristics. Each of these factors is associated with different types of healthcare utilization and may help to explain some of the observed differences in the level of healthcare access and utilization among the three groups.

For the group of individuals exposed to the disaster, we observe higher than expected doctor visits, even after controlling for differences in predisposing and enabling factors. This is striking because the exposed group has a lower rate of a usual source of medical care, lower coverage by private health plans, and a lower level of educational attainment – all of which would suggest that their rates of healthcare utilization should be lower than that of the unexposed control group. Similarly, the comparison group of people exposed to mining but not the disaster exhibited higher levels of doctor visits and hospitalizations than the unexposed group, even though the mining community exhibited fewer predisposing and enabling factors than did the unexposed control group. Taken together, this suggests the exposed group may be utilizing healthcare at a higher rate due to different or more serious health needs. For the unexposed mining community, this difference could be due to the additional healthcare services provided (or facilitated) by the mining companies to their employees.

Studies on the use of healthcare services after disasters show divergent results[9-11]. The use of mental health and substance use services nearly doubled after the 2016 flood in Louisiana's capital. In addition, the costs of such medical care increased by 8 to 10%, which demonstrates an additional economic burden for those affected[10]. The need for healthcare services may not be limited to those directly affected. In Taiwan, after the 1999 earthquake, survivors who lost family members showed greater use of healthcare services compared to non-bereaving survivors, but this difference was no longer observed after one year[9]. The context is also important. For example, in New York City, there was no increased demand for mental healthcare services among the general population in the wake of the World Trade Center disaster, but the total number of visits among the current patients increased[11]. Thus, health planners should monitor the need for different types of healthcare services among those directly and indirectly affected by disasters while understanding that these needs may evolve over time.

When compared with the state of Minas Gerais, residents of Brumadinho were more likely to report that

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they can reach their doctor by phone, that it was easy to contact their doctor, that they believe their doctor knows about their health problems, and that they find it easy to explain the problems to the doctor. All of these factors have been associated with a stronger primary healthcare orientation as has been seen with the Family Health Strategy[12]. Moreover, greater contact with the healthcare system among the exposed and mining community groups in Brumadinho occurs alongside higher levels of preventive care, including a higher chance of having routine preventive care as well as receipt of immunizations. While we cannot assess if this relationship is causal, greater contact with the healthcare system could certainly provide greater opportunities for enhancing some forms of preventive care. Freitas et al similarly emphasized the importance of a strong healthcare infrastructure and its quick mobilization in Brumadinho, which may have mitigated some of the immediate impacts of the disaster[1]. In this sense, the Primary Health Care (PHC) organization must allow treatment and care actions to be aligned with prevention and health promotion actions, both at the individual and population levels. Faced with the context of the disaster, PHC must therefore do more to understand the needs of the population residing in the affected regions, especially the most vulnerable[13].

Finally, the results of the study suggest that many of the individuals in Brumadinho who do not currently have medium or high health needs appear to be utilizing healthcare at a lower-than-expected rate, as compared with state averages. These lower rates of consulting with the doctor mean fewer opportunities to monitor the development of new health problems which could potentially be the result of their exposure to the disaster[13].

In conclusion, despite important limitations imposed by the cross-sectional nature of the survey design, this study found that there were differences in healthcare utilization among individuals exposed to the dam failure. Thus, continued monitoring of the situation and assessment of the local capacity to deliver the services required is warranted, given that the consequences of being exposed to such an event may take considerable time to unfold[3].

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RESUMO

Objetivo: Em janeiro de 2019, uma barragem da mina Córrego do Feijão sofreu um rompimento catastrófico que matou 270 pessoas e causou danos extensos. Não se sabe como a exposição a tal desastre pode afetar a utilização dos serviços de saúde. **Métodos:** Avaliamos os dados do Projeto Saúde Brumadinho, estudo de coorte que incluiu pessoas expostas ao rompimento da barragem e dois grupos de comparação: pessoas não expostas à mineração ou ao desastre e pessoas de uma comunidade mineira, mas não expostas ao desastre. Os desfechos avaliados foram consulta médica ou hospitalização no último ano, fonte habitual de cuidados, pressão arterial e glicemia verificadas e haver recebido vacinas recomendadas, entre adultos de 18 anos ou mais. A regressão de Poisson robusta ponderada foi usada para avaliar as diferenças entre os expostos e os dois grupos de comparação, controlando por fatores de confusão. **Resultados:** indivíduos expostos tiveram uma razão de prevalência (RP) 15% maior de relatar uma consulta médica do que os não expostos. Para hospitalização e medidas de pressão arterial e glicemia, não houve diferença significativa entre os grupos. O grupo exposto teve RP 24% maior, e a comunidade mineira RP 143% maior de haver recebido imunizações preventivas em relação ao grupo não exposto. **Conclusão:** Houve diferenças na utilização dos serviços de saúde entre os indivíduos expostos ao rompimento da barragem. O monitoramento contínuo da situação é necessário, pois as consequências de um evento tão traumático podem levar um tempo considerável para se manifestar.

Palavras-chave: Desastre. Serviços de saúde. Mineração. Coorte.